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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/534,204	03/24/2000	Shinji Imai	Q56555	2972

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EXAMINER

LEE, SHUN K

ART UNIT	PAPER NUMBER
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2878

DATE MAILED: 05/10/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/534,204

Applicant(s)

IMAI ET AL.

Examiner

Shun Lee

Art Unit

2878

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 26 April 2002.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-58 is/are pending in the application.
- 4a) Of the above claim(s) 9-30, 32, 33 and 35-58 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8, 31 and 34 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 March 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 6.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Election/Restrictions*

1. Applicant's election without traverse of species I (claims 1-8) in Paper No. 12 is acknowledged.
2. Claims 9-30, 32, 33, and 35-58 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Election was made **without** traverse in Paper No. 12.

### *Drawings*

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: 90a (Figs. 3 and 10), 31a (Fig. 6), 32a (Fig. 6), 36a (Fig. 6), and 213 (Fig. 23). A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.
4. The drawings are objected to because:
  - (a) in Fig. 6, "25a" should probably be --26a--;
  - (b) in Figs. 8B and 8C, "1" should probably be --4--;
  - (c) in Figs. 9B and 9C, "1" should probably be --5--;
  - (d) in Fig. 17B, "226" should probably be deleted since it illustrates elongated glass substrate 226 between electrodes 223a which is not illustrated in Fig. 17A or described in the specification; and

(e) in Fig. 18B, "2 2a" should probably be --225a--.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

### ***Specification***

5. The disclosure is objected to because of the following informalities:

- (a) in line 14 on pg. 4, "diode" should probably be --dynode--;
- (b) in line 10 on pg. 21, "figures" should probably be deleted;
- (c) in line 26 on pg. 37, "figures" should probably be deleted;
- (d) in line 16 on pg. 61, "figures" should probably be deleted;
- (e) in line 15 on pg. 69, "23" should probably be --L3-- (see "23" in line 16 on pg. 69, "L3" in line 17 on pg. 71 and Fig. 3, and 37 CFR 1.84(p)(4));
- (f) in line 24 on pg. 69, "22a" should probably be --26a--;
- (g) in line 11 on pg. 74, "22" should probably be --22a--;
- (h) in line 6 on pg. 80, "figures" should probably be deleted;
- (i) in line 8 on pg. 80, "2 figures" should probably be --ratio of 2--;
- (j) in lines 9 and 11 on pg. 100, line 14 on pg. 101, "flat" should probably be deleted  
(the electrodes illustrated in Fig. 13B are not flat);
- (k) in line 16 on pg. 115, "L" should probably be --L3--;
- (k) in line 22 on pg. 115, "212" should probably be --223c-- (reference characters "223c" and "212" have both been used to designate photoconductive material layer, 37 CFR 1.84(p)(4));

- (l) in line 19 on pg. 116, "223" should probably be --223c--;
- (m) in line 1 on pg. 119, "22a and 26a" should probably be --223a and 223b--;
- (n) in line 14 on pg. 120, "figures" should probably be deleted;
- (o) in line 16 on pg. 120, "2 figures" should probably be --ratio of 2--; and
- (p) in line 13 on pg. 124, "223s" should probably be --223c--.

Appropriate correction is required.

6. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

#### ***Claim Objections***

7. Claim 5 is objected to because of the following informalities:
- (a) in claim 5, "the electric voltage application means" on pg. 130, lines 9-10 should probably be --the electric voltage imparting means--; and
  - (b) in claim 5, "such an electric field as to generate an avalanche amplification effect" on pg. 130, lines 10-11 should probably be --said electric field as to generate said avalanche amplification effect--.

Appropriate correction is required.

#### ***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claims 1-4 and 5-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van den Bogaert (Research Disclosure 34264, October 1992) in view of Tsuji *et al.* (US 5,196,702).

In regard to claims 5-7, Van den Bogaert discloses (Fig.) an image read-out system comprising:

- (a) a stimulating light source (left column, lines 39-43) which emits stimulating light (7) in a wavelength range of greater than 600 nm,
- (b) a stimulating light scanning means (left column, lines 49-57) which causes the stimulating light (7) emitted from the stimulating light source to scan a stimuable phosphor sheet (1) having a layer of stimuable phosphor which emits stimulated emission in a wavelength range less than 500 nm (*i.e.*, 390 nm; right column, lines 13-17) in proportion to the stored energy of radiation upon exposure to the stimulating light (7),

- (c) a solid image sensor (left column, lines 17-33) having a photoconductive material layer (3) the major component of which is a-Se (right column, lines 13-17) and which exhibits electric conductivity upon exposure to the stimulated emission from the stimuable phosphor sheet (1),
- (d) an electric voltage imparting means (6) which imparts an electric voltage to the photoconductive material layer (3) of the solid image sensor to apply an electric field in the photoconductive material layer (3), and
- (e) an image signal obtaining means (5, 8) which detects electric charges generated in the photoconductive material layer (3) of the solid image sensor when the stimuable phosphor sheet (1) is exposed to the stimulating light (7) and stimulated emission emitted from the stimuable phosphor sheet (1) impinges upon the photoconductive material layer (3) with an electric voltage imparted to the photoconductive material layer (3) by the electric voltage imparting means (6) to apply the electric field in the photoconductive material layer (3), and detects an image signal representing an image stored on the stimuable phosphor sheet (1).

The image read-out system of Van den Bogaert lacks that said photoconductive material layer of the solid image sensor is 1  $\mu\text{m}$  to 100  $\mu\text{m}$  (or 10  $\mu\text{m}$  to 50  $\mu\text{m}$ ) in thickness and wherein the electric field generates an avalanche amplification effect.

The properties of the a-Se photoconductive material layer of Van den Bogaert is well known in the art. For example, Tsuji *et al.* teach (column 24, lines 15-39) to provide a 0.1  $\mu\text{m}$  to 500  $\mu\text{m}$  a-Se photoconductive material layer and to apply an electric field sufficient for avalanche amplification in order to enhance the quantum efficiency of the

a-Se photoconductive material layer for the light. Therefore it would have been obvious to one having ordinary skill in the art to provide a 0.1  $\mu\text{m}$  to 500  $\mu\text{m}$  a-Se photoconductive material layer in the image read-out system of Van den Bogaert, and to apply an electric field sufficient for avalanche amplification in order to enhance the quantum efficiency of the a-Se photoconductive material layer for the light.

In regard to claims 1-3, the method steps are implicit for the modified apparatus of Van den Bogaert since the structure is the same as the applicant's apparatus of claims 5-7.

In regard to claim 4 (which is dependent on claim 1) and claim 8 (which is dependent on claim 5), the image read-out system of Van den Bogaert lacks that fluctuation of the image signal due to fluctuation in the electric field applied to the photoconductive material layer is suppressed by a fluctuation suppressing means. Tsuji *et al.* teach (Fig. 10; column 22, lines 34-62) that there is a steep increase in quantum efficiency when the applied electric field increases and (column 1, lines 24-30) that a storage type photo-sensor functions by storing and reading out an electrical signal according to the quantity of an incident light. Quantum efficiency must be constant in order to store and read out an electrical signal according to the quantity of an incident light since changes in quantum efficiency results in storage and read out of an electrical signal that does not correspond to the quantity of an incident light. A constant quantum efficiency indicates a constant applied electric field. Therefore it would have been obvious to one having ordinary skill in the art to provide a fluctuation suppressing means (*e.g.*, a constant voltage source) in the image read-out system of



Van den Bogaert, in order to obtain a constant quantum efficiency so as to store and read out an electrical signal according to the quantity of recording light.

11. Claims 31 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van den Bogaert (Research Disclosure 34264, October 1992) in view of Tsuji *et al.* (US 5,196,702) and Hunter *et al.* (US 6,192,105).

In regard to claim 34, Van den Bogaert is applied as in claim 5 above.

Van den Bogaert also discloses (left column, lines 36-39) a stimuable phosphor layer having a prompt emission (*i.e.*, momentary light emitted from the stimuable phosphor layer upon exposure to the recording light). Since the prompt emission and the photostimulated emission has the same wavelength range (see Van den Bogaert left column, lines 34-39), it is inherent that the photoconductive material layer exhibits electric conductivity upon exposure to either photostimulated or prompt emission from the stimuable phosphor layer. Tsuji *et al.* teach (column 24, lines 15-39) that a photoconductive material layer exhibits electric conductivity upon exposure to the recording light (*i.e.*, X-ray). The image read-out system of Van den Bogaert lacks a preliminary read-out image signal obtaining means which obtains a preliminary read-out image signal bearing thereon image information by detecting charges generated in the photoconductive material layer when the recording light or the momentary light impinges upon the photoconductive material layer. Hunter *et al.* teach (Fig. 7) to provide an automatic exposure control device (*i.e.*, preliminary read-out image signal obtaining means) comprising a photoconductor (*e.g.*, a-Se) detector in order to obtain the correct x-ray exposure (column 1, lines 13-23). Therefore it would have been obvious to one

having ordinary skill in the art to provide a preliminary read-out image signal obtaining means in the image read-out system of Van den Bogaert, in order to obtain the correct x-ray exposure as taught by Hunter *et al.*

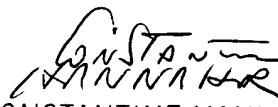
In regard to claim 31, the method steps are implicit for the modified apparatus of Van den Bogaert since the structure is the same as the applicant's apparatus of claim 34.

### **Conclusion**

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shun Lee whose telephone number is (703) 308-4860. The examiner can normally be reached on Tuesday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank Font can be reached on (703) 308-4881. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

  
CONSTANTINE HANNAHER  
PRIMARY EXAMINER  
GROUP ART UNIT 2878

SL  
May 7, 2002